Brief Communications

Prolonged Static Magnetic Field Exposure and Myeloma

Robert T.S. Jim MD
Professor of Medicine
John A. Burns School of Medicine, University of Hawaii

Recently, concern about exposure to electromagnetic fields has been expressed.[1-4] Although a definite cause and effect between these fields and cancer has not been established, we report a case in which the patient, who slept on a magnetic mattress for 5 years, developed myeloma.

Case Report

A 71-year-old Japanese man, who had retired from his position as an accountant supervisor, fell and fractured his T-12 vertebrae. He had anemia, monoclonal protein spikes in his urine and serum, an abnormal bone scan with multiple areas of increased activity, and IgA myeloma was confirmed by bone marrow examination.

For 5 years he had slept on a magnetic mattress, about 72 in x 32 in x 2 in, and a pillow, about 24 in x12 in x 2 in, with 20 mm round, flat magnets, each with a magnetic flux of 900 Gauss, 1.09T, evenly distributed: 88 in the mattress, 40 in the pillow. A Geiger count disclosed no radiation from the magnets.

Discussion

The etiology of myeloma, believed to be a malignant disease of the bone marrow, is unknown.[5] Recently, artificially generated sources of EMF have been suggested as a risk factor for cancer. Whether natural or static magnetic field exposure is a risk factor is unknown.[6]

No reports were found in a 10–year Medline literature search for EMF exposure that caused myeloma. In this patient, there is no proof that the prolonged magnetic field exposure from the mattress and pillow caused his myeloma. However, the possibility of prolonged static magnetic field exposure inducing transformation of benign plasma cells to malignant myeloma cells is raised.

REFERENCES

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The Robert T. Wong Lectureship February 1994

J.I. Frederick Reppun MD
Past Editor of the HMJ
Retired General Practitioner

R. Michael Blaese MD, chief of clinical gene therapy at the National Center for Human Genome Research, was introduced by Chris Gulbrandsen MD, dean of the UH John A. Burns School of Medicine, to an audience of about 40 persons during the Robert T. Wong Lectureship that was open to the general public. Dr Blaese had been lecturing all that week in Honolulu. For this, his last lecture, he chose the general topic of "Gene Therapy."

Electing to discuss the genetic aberrations that afflict humans, Blaese revealed the impressive figure that there are some 4,000 so-called inherited diseases in humans.

In simple terms, gene therapy consists of inserting genes into a human cell to program its function, similar to slipping a program diskette into a computer disk drive. The newly programmed gene is then inserted into the nucleus of a cell of a patient. This is not easy to do. Research, however, has revealed a successful way of doing this by means of using transfer agents, the best and most practical of which are retroviruses (RV), which contain only 3 genes, as compared with 100,000 genes in a human. The introduced good (or bad) gene carried by the RV is integrated into the chromosome that has a "long-term repeater" at both ends to assure that the successful implant is not short-lived.

At this point, Blaese digressed a bit to point out that it is possible to transfer desirable, as well as undesirable, genes in or out. This poses an ethical dilemma because no one wants to see a monster grow; nor should a theoretical gene that would guarantee an IQ of 250 be experimented with. Consequently, such research has strict monitors overlooking it: one is a special advisory committee of the NIH and the other is the FDA. The United States is the only country, so far, that has this control in operation.

Under guidelines, therefore, gene therapy is limited to non-germinal organs and tissues in order to avoid the possibility of the inserted or extracted gene affecting the next generations. Somatic cell tissue ex-vivo is an acceptable source for research, but reproductive cell tissue is specifically forbidden.

Additionally, it has been found that tissues of the bone marrow, muscle, liver and kidney can be experimented on, but that the nerve cells and brain cells are not usable because, unlike the cells of the rest of the human body, these do not replicate